

Service provision method via a network and service provision
system using the same

BACKGROUND OF THE INVENTION

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Field of the Invention

The present invention relates generally to a service provision method via a network such as the Internet, more

10 particularly, to a service provision method and a service provision system using the same by which a stable service can be provided, when more access requests become concentrated to one server, which provides the service.

15 Description of the Related Arts

Recent rapid spread of the Internet brings a plurality of service providing sites providing a variety of different services, such as information provision, commodity sales, 20 or mail delivery. A user who wants to use these services can access to the above described service providing sites and gets these services with relatively easier procedures by using a personal computer connected to the Internet.

Some service providence sites become congested 25 because more access requests from the user become centralized at the same time with a reason of their higher popularity and the like. Such the more popular sites need

to prepare a server having an ability enough to cope with the large number of access requests with a high performance.

In this way, the conventional service providing server via a network is designed so as to be acceptable to the estimated number of access requests, with nothing like the service providing sites on the Internet.

When more accesses over the estimated number of accesses become centralized, then, the server does not specially deal with the problem, and therefore, a stable

10 service provision cannot be continued such that the user cannot access to the service with reasons of the server's performance lowering or the termination of service providence. Therefore, some service providing sites send messages to cope with users who cannot access.

15 However, even when the conventional method is used, the user who cannot access the service repeats sending the access request to the server over and over, because they cannot hold the condition of server, when more accesses over the estimated number become concentrated to one service 20 provision server, and that causes a vicious circle such as over load on the server. Further, since the user accessing to the server does not hold the congested condition, the user is not expedited to exit and continues using the service as usual. Therefore, it is impossible 25 to improve the congested condition by finishing to use the service earlier.

Moreover, some users give up to access the site because

of the congested condition such as they cannot understand when they can access, and some users have a bad impression to the service providence site, because of hardness to access to the site or response delay at the accessed time,
5 so that there is a possibility to lose service provision chances.

Therefore, the conventional service provision method gives the larger losses, when more access requests over the ability of server become centralized, so that effective

10 or stable service cannot be provided for more many persons.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention
15 to provide a service provision method and system that provide a stable service via a network by keeping the stable access condition and suppressing losses of service providing chances for the users to the least, when more accesses over the ability of server become centralized.

20 In order to attain the above object, according to a first aspect of the present invention, there is provided a method of informing the number of accesses to user at that time the accessable number exceeds, when a user sends an access request to a server, which provides the service,
25 with no execution of immediate access to the server, updating the information as occasion, and executing the access to the server for the waiting user, when the user

becomes accessible. Therefore, according to the present invention, since the user concretely holds the user's own waiting state in figures and need not to access again till the user can access to the server, the conventional access repetition and the case where the user gives up to access to the server are decreased. Thereby, when more access requests over the ability become centralized, the stable access condition can be held, losses of the service provision chances can be suppressed, and therefore, effective service provisions can be executed.

Further, in the preferred mode of the above invention, when the access to the server becomes available, it is informed for the user to be accessible by a display screen, voice or E-mail before executing the connection.

Additionally, in the other mode of the above invention, a period of updating the information of the number of accesses is varied according to the information of the number of accesses.

According to the more preferred mode of the above invention, an estimated time till the user becomes accessible, which is obtained according to the time variation of the information of the number of accesses, is informed to the user with the information of the number of accesses.

Furthermore, in the other mode of the above invention, when a commodity sale service is provided, the number of goods in stock is informed to the user with the information

of access number.

Moreover, in the other mode of the above invention, when the access requests to the server, which provides the service, become more than the accessable number, the 5 information of the number of accesses is informed for all users who are using the server.

The above and other objects, aspects, features and advantages of the present invention will become more apparent from the following detailed description of a preferred

10 embodiment thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a structural diagram of a service provision 15 system applied to the present invention;

FIG. 2 is a diagram showing a processing flow chart, when an access request is sent to the service provision system according to the present embodiment;

FIG. 3 is a diagram showing one example of a display 20 screen showing information of the number of accesses;

FIG. 4 is a diagram showing one example of a display screen displayed for users, when access to the site becomes available;

FIG. 5 is a diagram showing one example of an electric 25 mail sending the user when access to the site becomes available;

FIG. 6 is a diagram showing one example of display

screen showing information of the number of accesses when displaying an estimated time (estimated accessable time) till they can access to the site.

FIG. 7A shows one example of a display screen of urging 5 users to input password and FIG. 7B shows one example of display screen after password authorization;

FIG. 8 is a diagram showing one example of display screen for displaying the number of goods in stock for users;

FIG. 9 is a diagram showing one example of display 10 screen for informing no goods in stock for user;

FIG. 10 is a diagram showing one example of E mail for informing no goods in stock for users; and

FIG. 11 is a diagram showing one example of urging screen displayed for the accessing user.

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DESCRIPTION OF THE PREFERRED EMBODIMENTS

Presently preferred embodiments of the present invention will now be described with reference to the 20 accompanying drawings. However, such embodiments do not limit the technical scope of the present invention. The same reference numerals are used to denote and identify corresponding or identical components.

FIG. 1 is a structural diagram a service provision 25 system applied to the present invention. The service provision system according to the present embodiment includes a server of a service provider side, which is

composed of a server 1 for allocating accesses addressed to the server, and a server 2 for queuing for connection and a contents server 3, and a section 51 for indicating information of the number of accesses and a section 52 for 5 regularly obtaining the number of accesses in a client 5, which is a terminal machine owned by a user who gets the service provision.

The client 5 is a client system composed of a personal computer, which is accessible to the above-described server

10 via a network such as the Internet. Additionally, software for getting a service from the server, such as a browser for the Internet, is provided. The user of service provision system uses the software to access the server to get the service provision. In this example, a plurality 15 of clients 5 may exist on the network 4.

The destination allocating server 1, which is composed of a computer system, such as a personal computer or a work station, takes a part of allocating the destinations of client 5 into the connection queuing server 20 2 or the contents server 3, when the user send an access request through the above described client 5.

As is shown in FIG. 1, the destination allocating server 1 includes a processing section 11 for allocating the destination and an informing section 12 for informing 25 the number of accesses. The destination allocating processing section 11 having a unique address on the network 4 (In the case of the Internet, the unique address means

URL) is connected first to the unique address when the user sends the access request, where the above described allocation is executed. Every time the user sends the access request, the destination allocating processing section 11, which manages an access number, issues a unique access number for the access request. In this example, the access number means the total number of access requests for this service provision system, of which initial value is zero and to which one increases every time an access request incomes.

Further, the accessed number informing section 12 takes a part of sending and receiving information associated to the access number to the service provision system such as the above described accessed number to and from the connection queuing server 2. Moreover, it is desirable to mount the destination allocating processing section 11 and the accessed number informing section 12 by a computer program and a control device for executing processes according to the computer program.

Next, the connection queuing server 2 including a accessed number management section 21 and an accessed number informing section 22, as shown in FIG. 1, is a server, to which the client 5 are connected, when the user cannot access to the contents server 3 for executing actual service provision in the time of sending the access request from the client 5, i.e., more access requests over the ability of contents server 3 become centralized.

The accessed number management section 21 having a unique address on the network 4 provides information associated to the number of accesses to this service provision system. The section 21 further manages a submitted accessable number meaning the above described access number showing the upper limitation enabled to access to the contents server 3. As a value of submitted accessable number, a value of the maximum connectable number of the contents server 3 (correctly speaking, it is a contents service section 31 described later) is used at the initial state, and one increases to the value, every time the connection to the accessing client 5 is finished.

When the maximum connectable number is 1000, the initial value of submitted accessable number is '1000', and the value increases one by one every time the connection with the accessing clients 5 is finished, as 1001, 1002...

Additionally, the accessed number informing section 22 sends and receives information associated to the number of accesses between the destination allocating server 1 and the contents server 3 and updates the above-described submitted accessable number according to the information of access termination, which is transmitted from the contents server 3, similarly to the accessed number informing section 12. Further, it is desirable to compose the connection queuing server 2 of a computer system such as a personal computer or a work station and to mount the accessed number management section 21 and the accessed

number informing section 22 by a computer program and a control device for executing the process according to the program.

The contents server 3, which includes a contents service section 31 and the accessed number informing section 32, actually provides a service in the service provision system. The contents service section 31 having a unique address on the network 4 provides a variety of prepared services for the client 5 who permits to access this address.

10 More specifically, the contents server 3 provides information and sells goods according to an operation on the client 5 owned by the user. The accessed number informing section 32 sends and receives information associated to the number of accesses to and from the 15 connection queuing server 2.

It is also preferable to compose the contents server 3 of a computer system, such as a personal computer or work station, similar to the other servers, and to mount the contents service section 31 and the accessed number informing section 32 by a computer program and the control device executing the processes according to the program.

Subsequently, the accessed number information displaying section 51 and the accessed number regularly obtaining section 52 activate, when one client 5 who sends 25 one access request is connected to the above described connection queuing server 2, i.e., the client 5 waits the connection to the above described contents service section

31, regularly obtain information relating to the number
of accesses from the connection queuing server 2, and
informs the queuing condition to the user by displaying
the information on the client 5. In here, it is preferable
5 that the accessed number information displaying section
51 and the accessed number regularly obtaining section 52
are respectively composed of Java applet transmitted from
the connection queuing server 2 to the client 5, when the
client 5 is connected to the connection queuing server 2.

10 Although the destination allocating server 1, the
connection queuing server 2 and the contents server 3, are
individually composed of three servers, each of which is
independent, it may be applied to compose these three servers
of one server to logically share a resource and manage the
15 shared resource.

As is described above, in the service provision system
relating to the present invention, when more access requests
over ability of the service providence server become
concentrated, the queuing condition is informed to the user
20 until the user can access as occasion, without immediately
accessing to the server, and the user can access to the
server, when the user becomes accessable.

FIG. 2 shows a flowchart when an access request to
the service provision system according to the present
25 invention occurs. At first, a user who employs the service
provision system requests access to the service provision
system from a browser of a client 5 (Step S1 of FIG. 2).

Then, the client 5 is connected to the destination allocating processing section 11 of the destination allocating server 1, and then, the destination allocating processing section 11 counts up one to the above described 5 access number and issues one access number for one access request (Step S2 of FIG. 2).

Next, the destination allocating processing section 11 queries the submitted accessible number at that time to the accessed number management section 21 in the

10 connection queuing server 2 through the accessed number informing section 12 and 22(Step S3 of FIG. 2), and the management section 21 transmits the submitted accessible number to the destination allocating processing section 11 in response to the query (Step S4 of FIG. 2). The 15 destination allocating processing section 11 compares the received submitted accessible number with the above issued access number and connects the client 5 to the contents service section 31 of the contents server 3, immediately (Step S6 of FIG. 2), when the access number is less than 20 the submitted accessible number (Yes of the step S5 of FIG. 2).

As the result of comparison, when the access number is larger than the submitted accessible number (No of the step S5 of FIG. 2), the destination allocating processing section 11 connects the client 5 to the management section 25 of the connection queuing server 2(Step S7 of FIG. 2), the client 5 becomes in the queuing state. In response

to that, the management section 21 transmits the information of the number of accesses, i.e., the access number of the client 5 and the submitted accessible number at that time, with a program, which composes the above described accessed 5 number information indicating section 51 and the accessed number regularly obtaining section 52 (Step S8 of FIG. 2).

The transmitted information of the number of accesses is displayed for the user by the accessed number information indicating section 51 on the client 5 receiving the

10 above-described transmission (Step S9 of FIG. 2). FIG. 3 is a diagram showing one example of the display screen. In the diagram, an x section represents the submitted accessible number and a y section represents an access number of the client 5. The user can hold the state of 15 queuing for connection at the indication of the display screen. It may be applied to display how many persons there are before connecting to the server, i.e., a value obtained by subtracting the value of x section from the value of y section shown in FIG. 3, without displaying submitted 20 accessible number and the access number, as shown in FIG. 3.

In this way, the accessed number regularly obtaining section 52 of the queuing client 5 queries the submitted accessible number according to the above described 25 transmitted program in a predetermined constant time interval at the queuing client 5 (Step S10 of FIG. 2). Additionally, it may be applied to automatically adjust

the time interval for this query in consideration of the load on the connection queueing server 2 without fixing the time interval of this query. More specifically, the time interval for query is varied according to the number of clients 5 for querying to the management section 21 in the access queueing state, for example, the value obtained by subtracting the value of x section from the value of y section shown in FIG. 3. Assuming that the connection queueing server 2 has a processing ability enough to reply to 1000 access requests at the same time and requires 2 seconds for every query process, the time interval for query is set to two seconds when the number of the access queueing clients is 1000, and the time interval for query is set to ten seconds ($2 \times (5000/1000)=10$), when the number of access queueing clients becomes 5000. Thereby, the time interval for query can be set to be longer, even when the number of clients 5 is larger, and the load on the connection queueing server 2 can be lighten, so that a constant response performance can be held.

20 The management section 21, which receives the query, transmits the submitted accessable number at that time to the client 5 (Step S11 of FIG. 2), the accessed number regularly obtaining section 52 compares the submitted accessable number with the access number of the client 5 25 (Step S12 of FIG. 2). As the result of comparison, when the access number is larger than the submitted accessable number (No of the step S12 of FIG. 2), i.e., the access

is not permitted, the processes from the step S9 of FIG. 2 are repeated and are executed. On the other hand, when the access number is less than the submitted accessible number (Yes of the step S12 of FIG. 2), the accessed number regularly obtaining section 52 connects the client 5 to the contents service section 31 of the contents server 3 (Step S13 of FIG. 2).

In this embodiment, it may be executed to connect to the contents service section 31 automatically at the

- 10 time of accepting the condition or it may be applied to display the connectable information on the client 5 to get the confirmation operated by the user. FIG. 4 is a diagram showing one example of display screen indicated for the user before executing the access request. If the user wants
- 15 to access to the site, the user can access to the contents service section 31 by selecting a section shown as an "entrance".

It may be applied to inform the user to become accessible by E-mail as shown in the example of FIG. 5.

- 20 In this case, the user need to pre-register the mail address in this service provision system, and to input data for identifying to specify the mail address at some stages of the access queuing time. It may be also applied to inform the user to become accessible by voice. Alternatively,
- 25 it may be applied that the user can select the informing methods using by a display screen, E-mail or voice.

In the present embodiment, although the steps S9,

S10, S12 and S13 of FIG. 2 are executed at the client 5 according to a program like Java applet transmitted to the client 5, it may be applied to execute these processes at the connection queuing server 2. In this case, when 5 information of the number of accesses is displayed to the client 5, it can be applied to transmit a HTML file of the display screen displaying the information of the number of accesses from the connection queuing server 2.

Returning back to FIG. 2, if the client 5 can access

10 to the contents server 3 (Steps S6 and S13 of FIG. 2), the user can get the service providence prepared at the contents service section 31 (Step S14 of FIG. 2). After that, when the user finishes (logs out) accessing to the contents server 3 or the contents server 3 forces finishing (sessions 15 out) to access to the user with a reason of no access from the user and the like, the contents service section 31 informs that to the management section 21 through the accessed number informing sections 32 and 22 (Step S15 of FIG. 2). The management section 21, which receives the 20 information, counts one up to the submitted accessible number according to the access termination information (Step S16 of FIG. 2).

Although processes from the time of sending an access request to the service provision system to the time of 25 finishing the connection are explained above, the overflowed access requests are connected to the connection queuing server, not to the service provision server, when

more access requests over the ability of server, which provides services, become centralized in this service provision system. Even if more access requests become centralized, therefore, a stable service provision can be 5 executed without lowering the response performance of the server, which provides a service. Additionally, the queuing state is concretely shown to the queuing user in figures, and therefore, the conventional access request repeating operation can be prevented. Moreover, since the 10 user can estimate the waiting time before the user can access, it becomes decreased that the user thoughtlessly gives up to get the service or the user can wait easily by effectively using the waiting time for executing some other operations till the user can access to the service.

15 As the modified example according to the above-described embodiment, it may be applied to display the estimated time (estimated accessable time) for the queuing user with the information of the number of accesses. FIG. 6 shows one example of the display screen at that time. 20 The bottom section of the display shows the above described estimated time. In this example, the user can know that it takes about twenty minutes to access the service. Moreover, the estimated time (estimated accessable time) can be obtained according to the condition of counting or 25 increasing the submitted accessable number as the following procedures:

The accessed number management section 21 of the

connection queuing server 2 that manages the submitted accessible number holds the condition of counting the number in a predetermined timing and transmits information of the condition of counting the number in addition to the accessed number information every time queuing from the accessed number regularly obtaining section 52. The accessed number regularly obtaining section 52 of the client 5, which receives the transmission, calculates the above-described estimated time (estimated accessible time) from the

10 information of the number of accesses and the information showing the condition, and displays the value to the user on the accessed number information displaying section 51.

When the submitted accessible number is counted up to 1000 for past five minutes, for example, the submitted accessible number is 10000 and the access number is 30000, the estimated time (estimated accessible time) can be obtained by calculating $(30000-10000) \div 1000 \times 5$ minutes=100 minutes. In this way, the users can hold the queuing condition, accurately, by displaying the estimated time in addition to the information of the number of accesses, and therefore, it makes possible to obtain more effectiveness. Moreover, it also becomes possible to obtain the estimated time (estimated accessible time) at the connection queuing server 2 and transmit the result to the client 5.

FIG. 7A and FIG. 7B are diagrams for explaining the other modified example. The modified example shows a

method of display screen of urging the user to input a password and accessing the client 5 of the user immediately to the contents server 3 regardless of the number of access requests at that time, if the inputted password is correct.

5 The user's password input may be executed at the first access request or the password input may be executed on a display screen of the information of the number of accesses displayed for the user, while the user is queuing.

FIG. 7A shows one example of the input display screen

10 of the latter case. If the user inputs a password on the display screen and the input password coincides with one of passwords pre-registered at the connection queuing server 2, the user becomes accessable to the contents server 3, and the display screen as shown in FIG. 7B is displayed

15 on the client 5. In this example, the user can connect to the contents server 3 to get the service provision by selecting a section shown as "Entrance". Additionally, in the modified example, a password authentication section for authentication of the above-described password and a

20 password record section for registering the password are provided at the connection queuing server 2. The addition of the password inputting function makes it possible to execute rapid service provision for specified user as occasion.

25 Moreover, as the other modified example, when the service provision is targeted for commodity sales, it may be applied to display the number of goods in stock with

the information of the number of accesses. This is a case where a service called a shopping mole is provided, and FIG. 8 shows one example of the display screen displayed for the user. In this case, the management section 21 of 5 the connection queuing server 2 obtains the information every time the goods is sold from the contents server 3, obtains the number of goods in stock, and transmits the number of goods in stock with the information of the number of accesses, when querying from the accessed number

10 regularly obtaining section 52 to the client 5. Moreover, the number of goods in stock may be obtained at the contents server 3 in every goods selling time.

Additionally, in the modified example, when the number of goods in stock becomes zero, not only zero is 15 displayed on the above described display screen, but a special display screen that shows no stock is displayed for the clients, for example, a message informing no stock. FIG. 9 is a diagram showing one example of the display screen.

20 Furthermore, one method for transmitting E-mail as shown in one example of FIG. 10 to the registered address of the user and the other method for transmitting the information of no stock from the client 5 to the user by voice are used instead of the display screen showing no stock. In this way, in the service provision system, which provides a 25 commodity sale service, not only losses of user's chances caused by giving up to buy goods can be decreased but the load on the server caused by the user's access regardless

of no goods can be lightened.

Moreover, in the other modified example, when more access requests over the ability become concentrated and the queuing clients 5 exist, it may be applied that a display

5 screen for urging the users who are accessing to the contents server 3 to get the service to finish the access earlier.

FIG. 11 is a diagram showing one example of the display screen. In this modified example, when the accessed number becomes larger than the submitted accessable number, the

10 management section 21 of the connection queuing server 2 transmits the information to the contents service section 31 of the contents server 3, the contents service section 31 receives the information and transmits the above described urging screen to the accessing clients 5. The

15 urging display screen urges the user to use the service earlier, because of user's apprehension for response speed delay or out of stock in the commodity sale service. As the result, the user finishes to access the contents server 3 earlier than usual so that the access condition can be 20 improved, when access requests become concentrated.

Hereinabove, according to a service provision system of the present invention, it becomes possible to keep stable access condition of the server providing the service, even when access requests become concentrated, and to suppress 25 losses of service provision chances for user to the least. Therefore, it also becomes possible to execute effective and stable service provision for users.

It should of course be understood that those, which are the same as the technical concept of the invention, are within the protective scope of the invention.

According to the present invention, even when users

- 5 cannot access to a desired server immediately, they can hold their own condition in figures and have no need to access again till they become accessable, and therefore, the conventional access repetition is decreased and the user's unreasonable giving up to access is also decreased.
- 10 Therefore, even if access requests over the ability occur, it becomes possible to keep stable access condition and suppress the losses of service provision chances, and therefore, effective service provision can be executed.